

Target Generation Facility (TGF) XML Editor Manual

Prepared for

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Table of Contents

TABLE OF FIGURES.....	iii
INTRODUCTION	2
2.0 WAYS TO START THE XML EDITOR.....	3
2.1 STARTING THE EDITOR FROM THE ECO GUI	4
2.2 STARTING THE EDITOR FROM THE COMMAND LINE	5
3.0 SELECTING VALUES NEEDED TO OPEN THE XML EDITOR	6
3.1 SELECTING AN XML FILE TO EDIT	6
3.2 SELECTING THE REPEAT ELEMENT	8
3.3 SELECTING THE PRIMARY KEY	8
4.0 THE PARTS OF THE XML EDITOR.....	9
5.0 MENU BAR.....	10
5.1 FILE MENU.....	10
5.1.1 <i>Check Validity</i>	10
5.1.2 <i>Create new XML file</i>	11
5.1.3 <i>Save (Ctrl-S)</i>	13
5.1.4 <i>Save As (Ctrl-A)</i>	13
5.1.5 <i>Save & Exit (Ctrl-X)</i>	13
5.1.6 <i>Close (Alt-C)</i>	14
5.2 EDIT MENU	14
5.2.1 <i>Add Menu</i>	14
5.2.1.1 <i>Add new using Schema (Ctrl-Insert)</i>	15
5.2.1.2 <i>Add new using Free Form (Ctrl-F)</i>	15
5.2.2 <i>Copy (Ctrl-C)</i>	15
5.2.3 <i>Delete (Ctrl-Delete)</i>	15
5.3 VIEW MENU	16
5.3.1 <i>Schema (Ctrl-V)</i>	16
5.3.2 <i>XML File (Alt-X)</i>	17
5.3.3 <i>Legend</i>	18
5.3.4 <i>Node Info</i>	19
5.3.5 <i>Node Options</i>	20
5.4 FORMAT MENU	20
5.4.1 <i>Font (Alt-F)</i>	21
5.5 SEARCH MENU.....	21
5.5.1 <i>Search Primary Keys (Ctrl-K)</i>	22
5.5.2 <i>Search Primary Keys Again (F3)</i>	22
5.6 HELP MENU	22
5.6.1 <i>Help (Ctrl-H)</i>	22

Table of Contents (continued)

- 6.0 PRIMARY KEY FIELD 23
- 7.0 ELEMENT MENUS 24
- 8.0 CHOICES 27
- 9.0 SCHEMA VALUES DEFINED BY TGF 29
 - 9.1 TOOLTip ELEMENT 29
 - 9.2 TGFDOCUMENTATION ELEMENT..... 29
 - 9.3 MULTILINE STRING TYPE 30
- 10.0 INVALID NODE VS. VALID NODE 31
- 11.0 TROUBLE SHOOTING/ERRORS..... 33
- 12.0 MISCELLANEOUS 35
- APPENDIX..... 36
- GLOSSARY 37

Table of Figures

<u>Figure No.</u>	<u>Title</u>
2.1	TGF's ECO GUI Edit Menu
2.2	Command Line
3.1	Select File
3.2	Example file Fix.xml
3.3	Select Repeat Key
3.4	Select Primary Key
4.1	TGF's XML Editor
5.1	File Menu
5.2A	File is Valid
5.2B	File is Invalid
5.3A	Select Schema for a new XML file
5.3B	Select file to save new XML to
5.3C	Enter value for primary key
5.4	Save As Dialog
5.5	Changes not saved
5.6	Edit Menu
5.7	Add Menu
5.8	View Menu
5.9	Schema File
5.10	Original XML file
5.11	XML Tree Legend
5.12	Node Info
5.13	Node Options
5.14	Format Menu
5.15	Font Dialog
5.16	Search Menu
5.17A	Search Primary Keys
5.17B	Text not found
5.18	Help Menu
6.1	Change to primary key

Table of Figures (continued)

<u>Figure No.</u>	<u>Title</u>
7.1	Element Menu 1
7.2	Element Menu 2
7.3	Element Menu 3
7.4	Choice dialog
8.1	Example of a <xs:choice> element
8.2	Choice dialog 2
9.1	ToolTip Element
9.2	MultiLine String Type Display
10.1	Valid Node
10.2	Invalid Node

1.0 Introduction

The Target Generation Facility (TGF) uses XML files to manage the data used in its flight simulator. Data used in the simulator includes fixes, airports, routes, star routes, runways, approaches, and so on. XML files usually are very complex making them difficult to edit in most standard editors. In order to facilitate the editing of all these various XML files TGF provides an XML editor. The XML editor is a Graphical User Interface (GUI) that allows the user to add and delete data from these XML files. Before you start using TGF's XML editor it is recommended that you save a backup of the XML file you are going to edit so that if something happens at least you can go back to the original.

2.0 Ways to Start the XML Editor

There are two ways to start the XML editor:

1. Using the [ECO GUI's edit menu.](#)
2. Using the [command line.](#)

2.1 Starting the editor from the ECO GUI

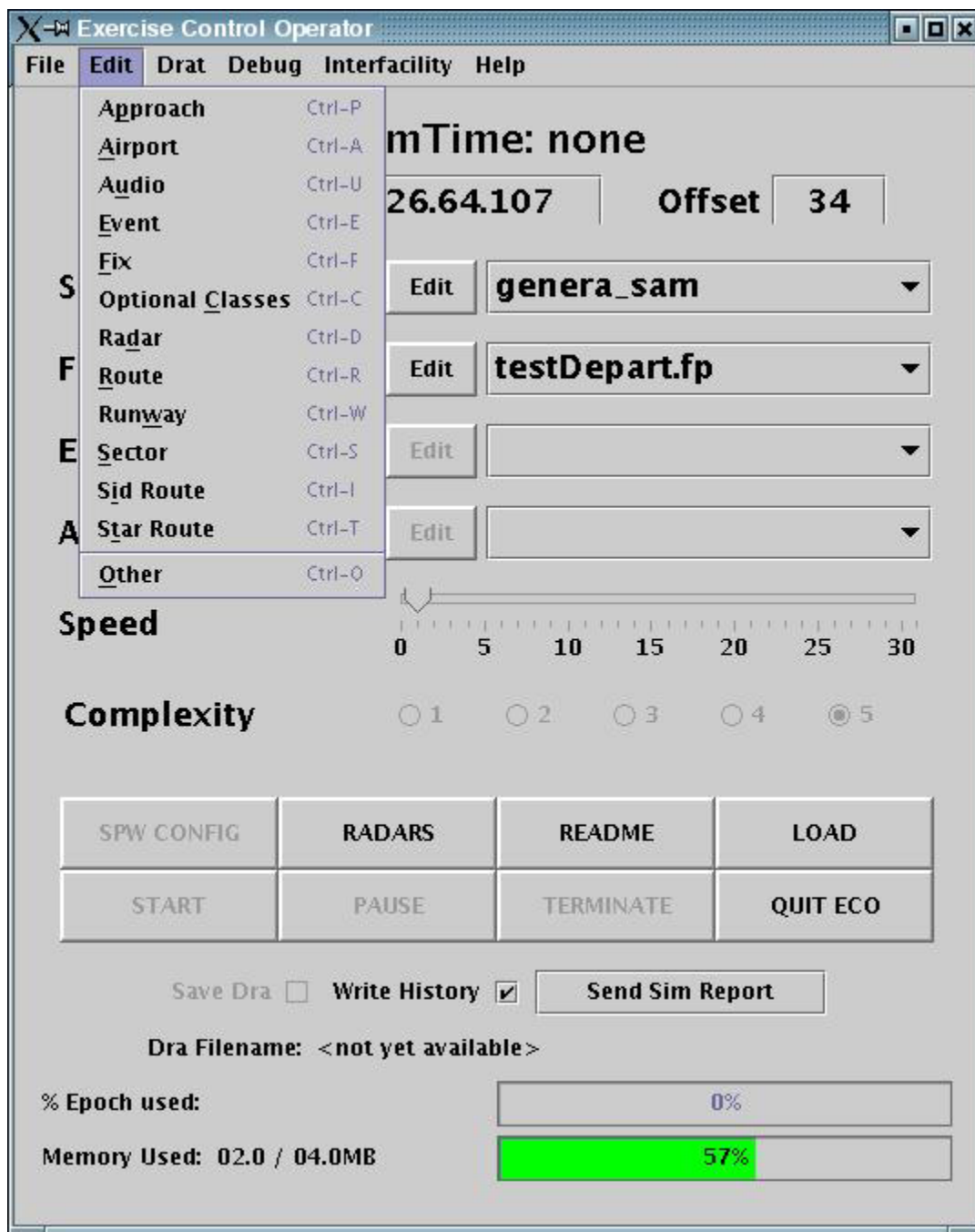


Figure 2.1 TGF's ECO GUI Edit Menu

To start TGF's XML editor, using TGF's ECO GUI, select the scenario from the drop down box where the file you wish to edit is located. Then click on the Edit menu (Figure 2.1) of TGF's ECO GUI and select the file you wish to edit. If the file you wish to edit is not in the list, then click Other and follow the directions for [selecting an XML file](#). See TGF User's Manual for more information on the ECO GUI's Edit menu.

2.2 Starting the editor from the Command Line

```
[samf@hawk lib]$ java -cp /tgf/lib/tgf.jar faa.tg.prep.xmleditor.gui.XmlEditor -u
Usage: faa.tg.prep.xmleditor.XmlEditor [{-f,--file}] [{-k,--key}] [{-r,--repeat}]

    -f,--file                The xml file to edit
    For example /tgf/data/genera/Fix.xml.

    -k,--key                  The name of the value to use as the primary key.
    For example in Fix.xml the primary key would be FixName.

    -r,--repeat               The repeat element in the xml file.
    For example in Fix.xml Fix is the repeat element.
```

Figure 2.2 Command Line

To start TGF's XML editor from the command line bring up a terminal or command prompt and type in `java -cp` full path and file name for the TGF jar `faa.tg.prep.xmleditor.gui.XmlEditor`. If you know the file that you wish to edit, then type `-f` or `--file` and the full path and file of the name you wish to edit. If you know the [repeat element](#) in the XML file, then type `-r` or `--repeat` and the repeat element name. If you know the [primary key](#) of the file you wish to edit, then type `-k` or `--key` and the name of the element you wish to use as the primary key. If you don't supply the file, the primary key, or the repeat element in the command line you will be asked to supply them later. See [selecting an XML file](#) for more information. For example if you wish to open [Fix.xml](#) in `/tgf/data/genera` and use `Fix` as the repeat element and `FixName` as the primary key you would type in `java -cp /tgf/lib/tgf.jar faa.tg.prep.xmleditor.gui.XmlEditor -f /tgf/data/genera/Fix.xml -r Fix -k FixName` and hit enter.

3.0 Selecting values needed to open the XML editor

There are three values that the editor needs in order to be able to open an XML file. The first value is the name of the XML file to open. The second value is a [repeat element](#) used along with the primary key to break up the XML file in to smaller more manageable pieces. The third value is a [primary key](#) used to uniquely identify each repeat element so that the user can tell what repeat element they are working on.

3.1 Selecting an XML file to edit

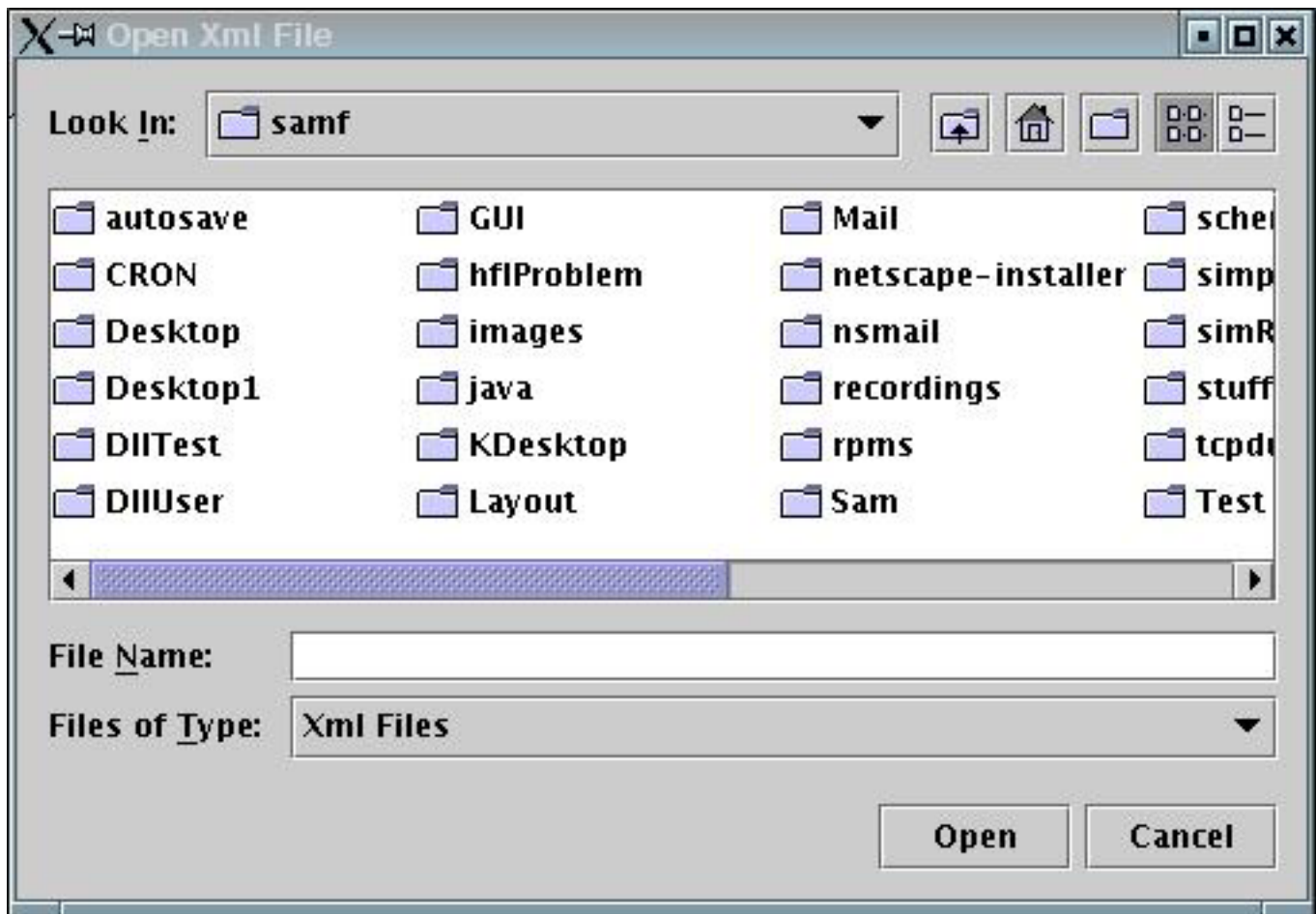


Figure 3.1 Select File

The XML editor will ask you to select the file you wish to open when you start the XML editor using either the other option on the ECO GUI's Edit Menu or if you do not supply the file in the command line.

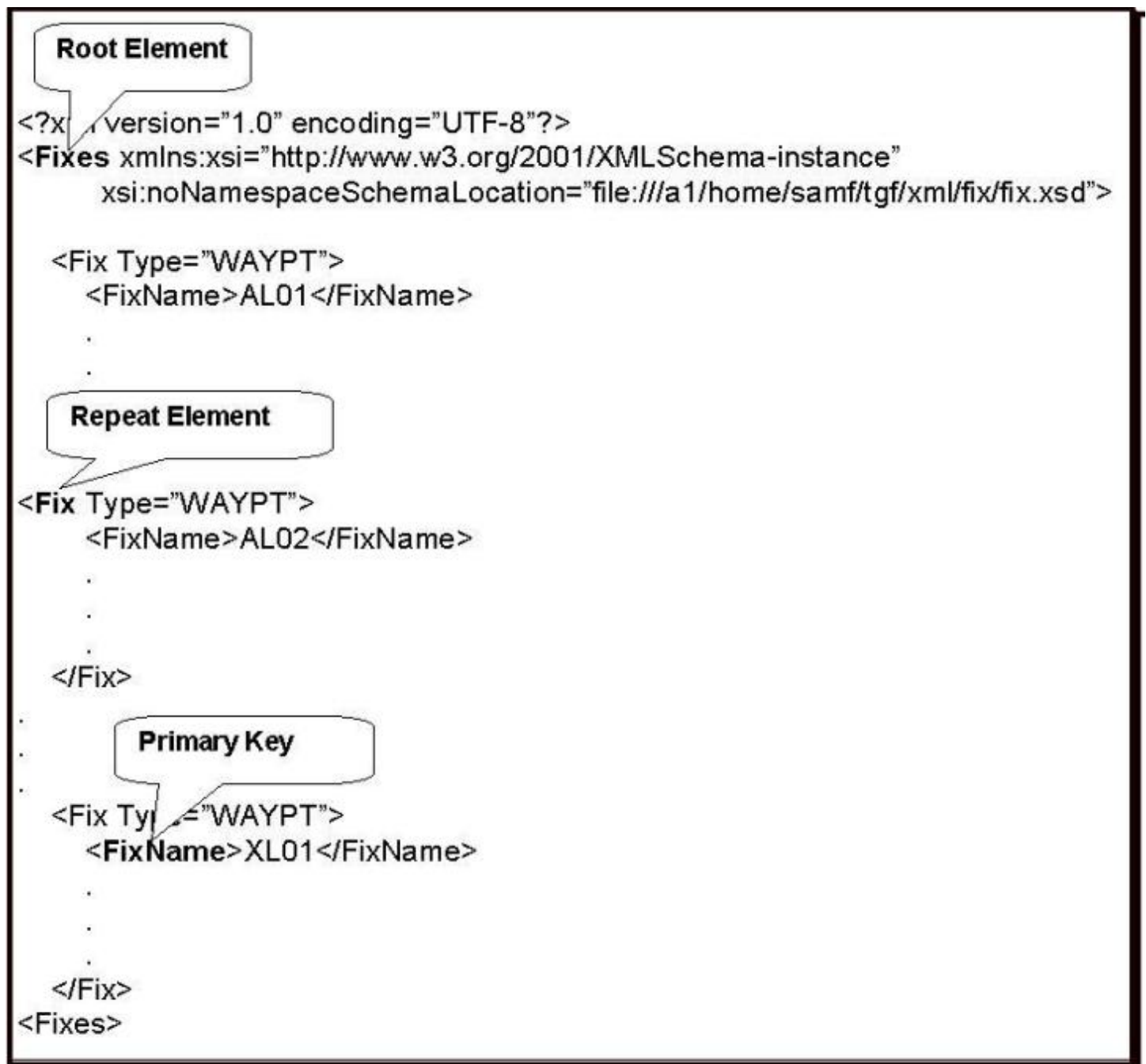


Figure 3.2 Example file Fix.xml

TGF's XML Editor currently assumes that the XML file contains a [root element](#) which contains one or more instances of another element called the repeat element. Inside of the repeat element is the primary key, an element that makes the repeat element unique from all the other repeat elements. You must supply the repeat element and the primary key in order to open the file.

3.2 Selecting the Repeat Element



Figure 3.3 Select Repeat Key

The editor will present you with a list of all the elements inside the root element of the XML file if the repeat element is not supplied upon opening the file. From that list you should select the element in the XML file that best fits the definition of a [repeat element](#). If you choose to use the [root element](#) as the repeat element the editor will disable the [primary key field](#) as well as the [Edit menu](#).

3.3 Selecting the Primary Key

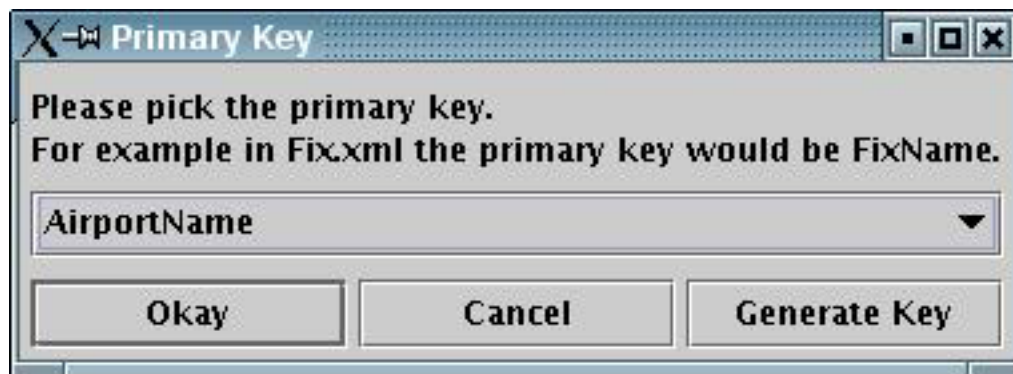


Figure 3.4 Select Primary Key

The editor will present you with a list of all the elements inside of the repeat element. From that list you should select the element in the XML file that best fits the definition of the [primary key](#). If there is no element in the XML that can be used as the primary key click on generate key and the editor will generate keys for all of the repeat elements in the file.

4.0 The parts of the XML Editor

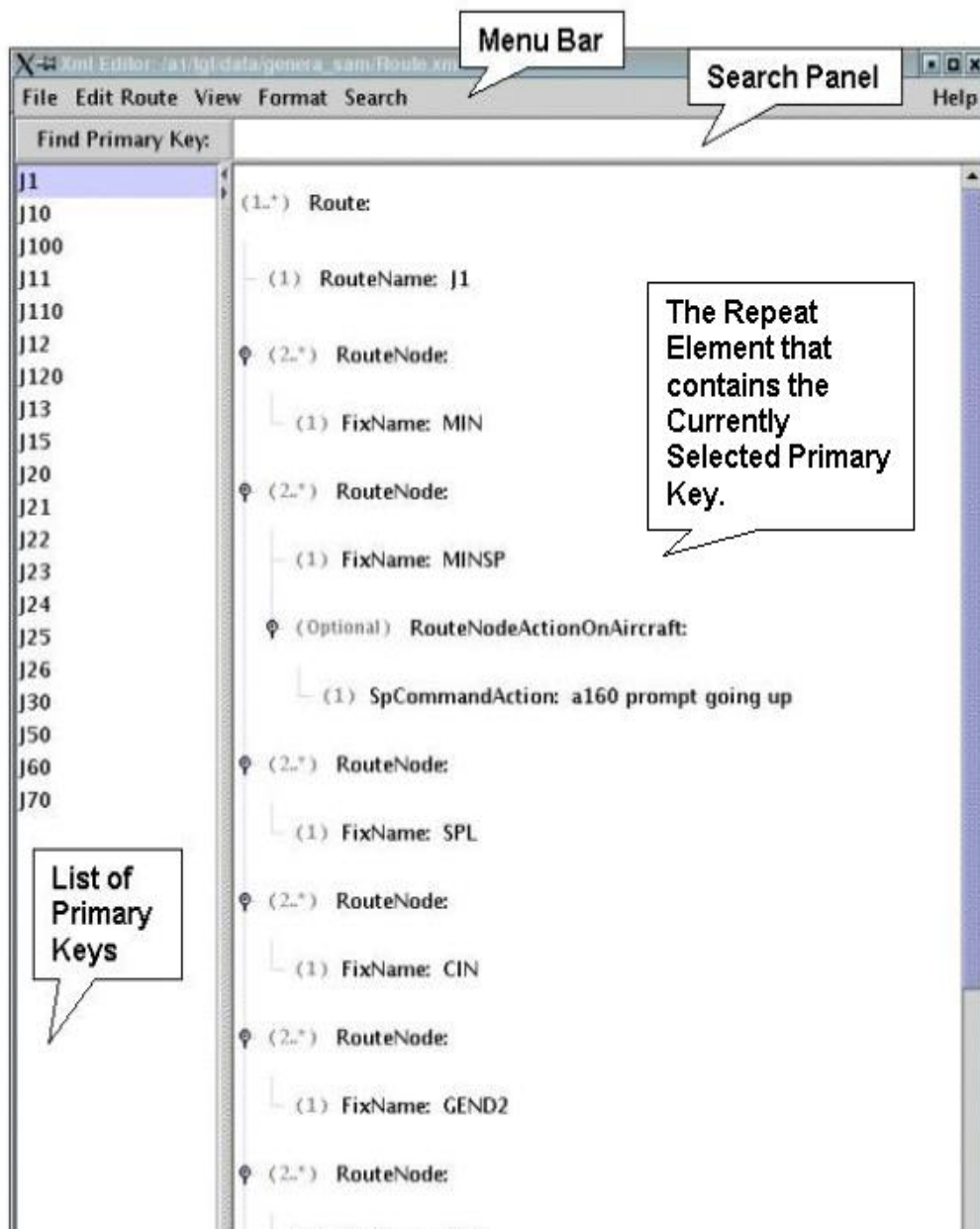


Figure 4.1 TGF's XML Editor

Above is a picture of TGF's XML Editor. The [menu bar](#) consists of various drop down menus that can be used to interact with the XML file. Below the menu bar is the search panel which can be used in connection with the [search menu](#) to search through the list of primary keys and find the given key. Below the search panel is a panel containing the list of primary keys and currently selected element. This panel's size can be changed simply by dragging the bar located between the list of primary keys and the repeat element that contains the currently selected key so that the panels are the desired size.

5.0 Menu Bar

The menu bar provides options that allow the user to interact with the XML.

5.1 File Menu

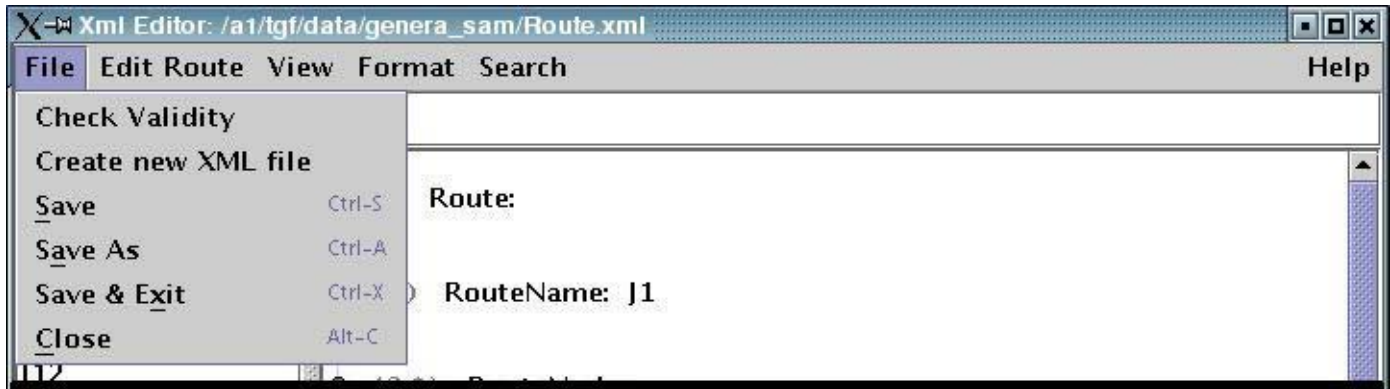


Figure 5.1 File Menu

5.1.1 Check Validity

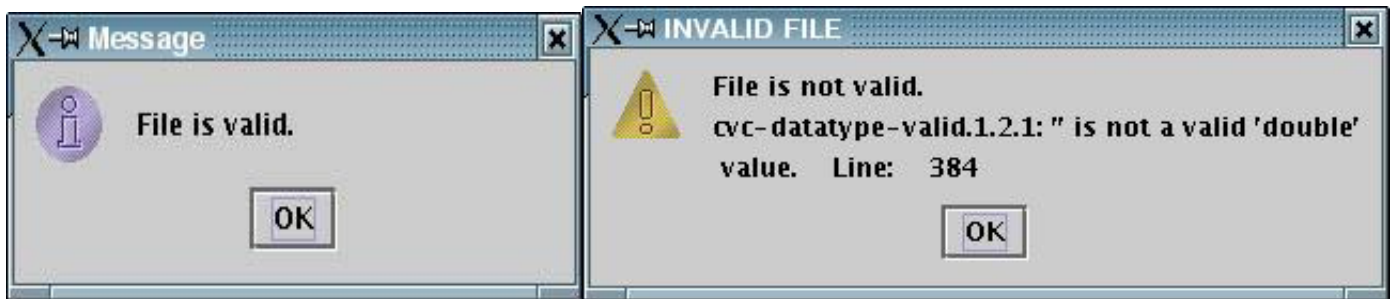


Figure 5.2A File is Valid

Figure 5.2B File is Invalid

The Check Validity option checks the validity against the schema specified in the XML file. This option will be disabled if there is no schema specification found in the file, or if the editor was unable to find the schema file. If the XML file is valid according to the specified schema, then you should see Figure 5.2A pop up. However, if the file is not valid according to the schema, you should see message similar to Figure 5.2B pop up saying one reason the file is not valid. The XML can be saved even if it is not valid, however if you try to import it into an application like TGF's ECO GUI, the file may not load. To ensure that a file is valid try to fill in all known values, delete any unnecessary elements, and check the validity of the file again. Note: check validity validates the XML file strictly against the schema specified in the file, which means that any elements that are not defined in the schema are considered invalid. Currently it is not possible for check validity to mark invalid nodes in any way.

5.1.2 Create new XML file

The Create new XML file option creates a new XML file based on a given schema. To create a new XML file follow the steps below:

Step 1. Choose a schema file that will define the new XML file (Figure 5.3A). If the editor is unable to import the chosen schema, you will receive an error message. Please see [Trouble Shooting/Errors](#) for more information.

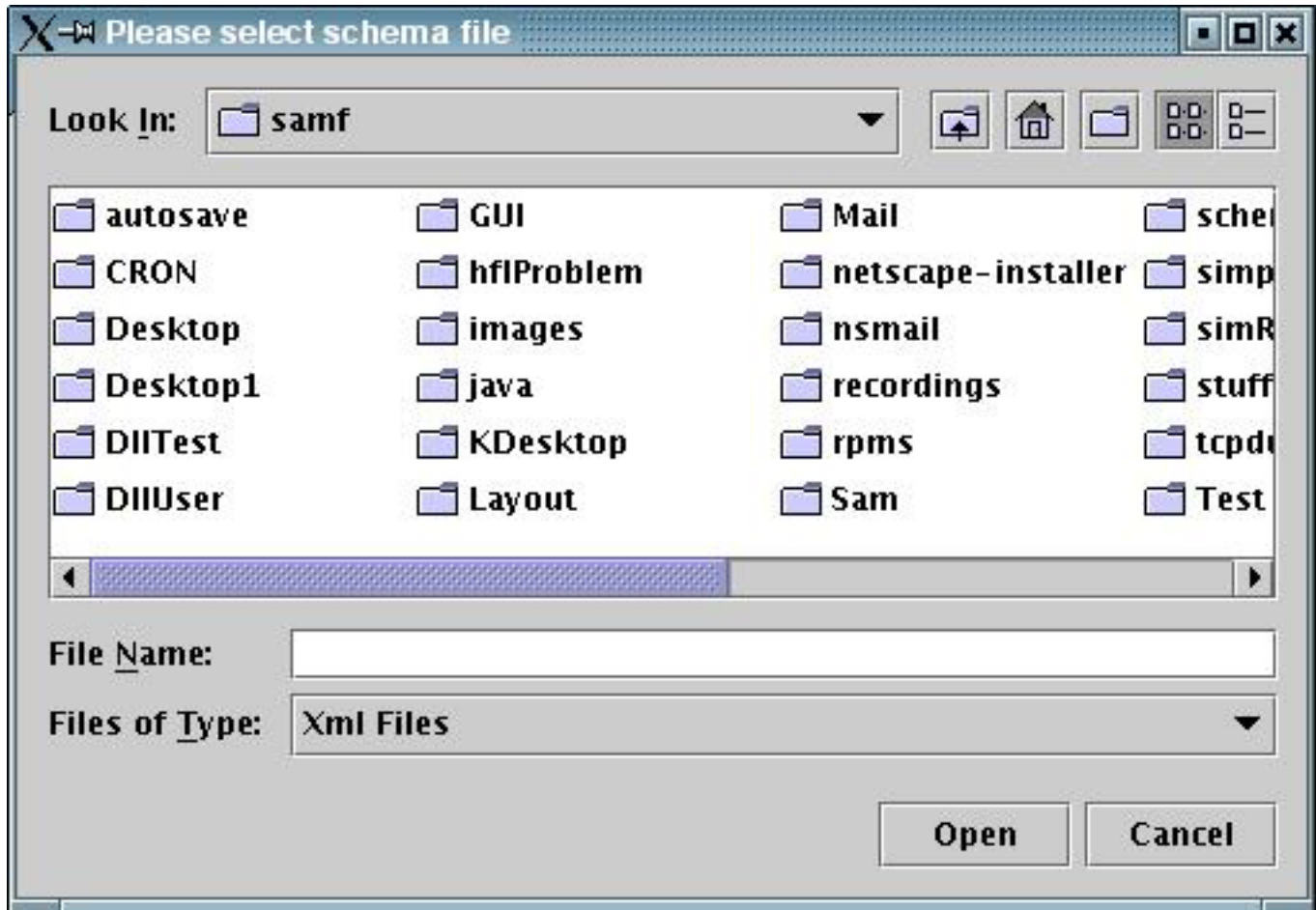


Figure 5.3A Select Schema for a new XML file

Step 2. Choose the name of the file for the XML to (Figure 5.3B). It can be any legal file name you want.

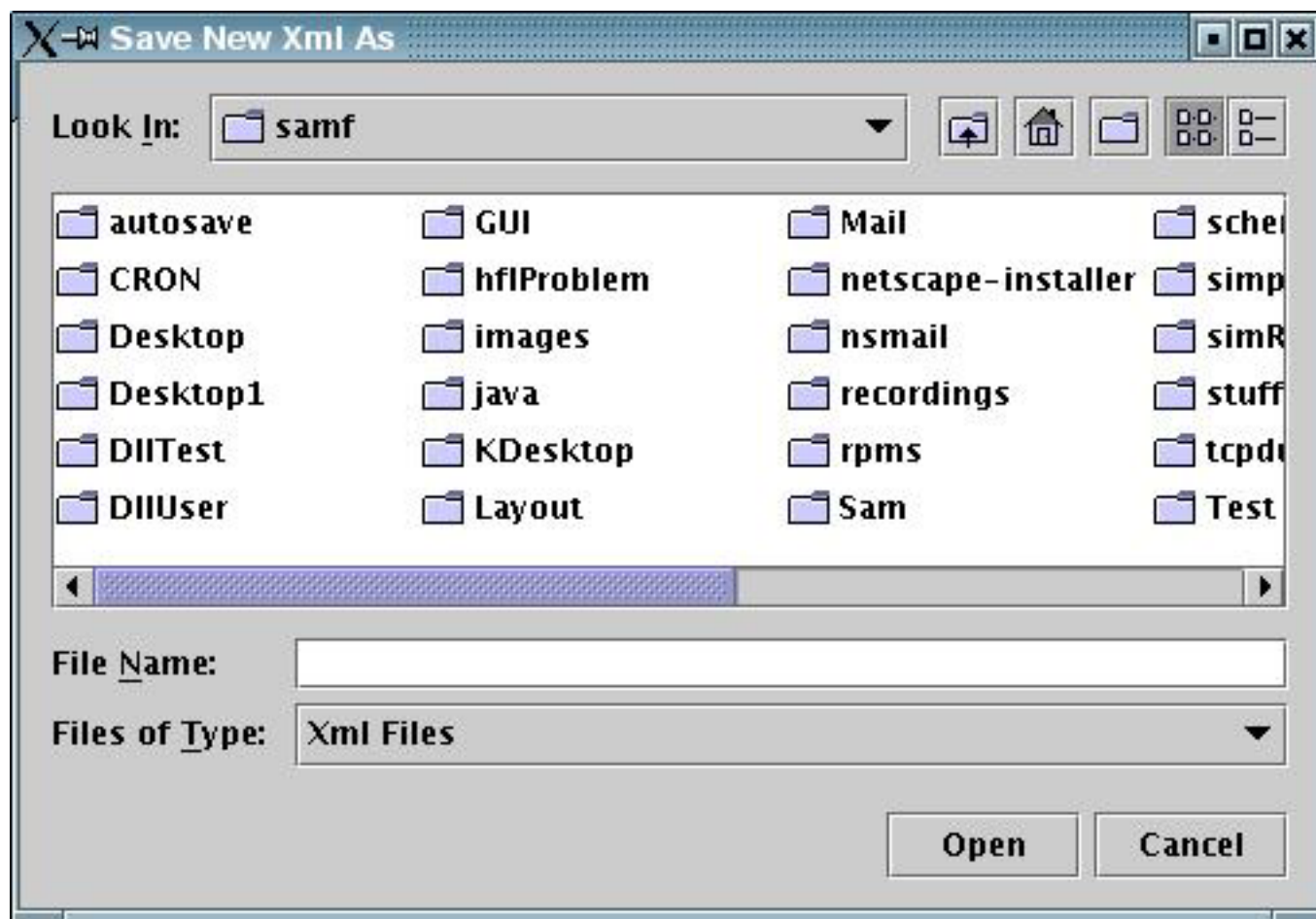


Figure 5.3B Select file to save new XML to.

Step 3. Next, choose the the element you want to use as primary key of the file (Figure 3.4). Fill in at least one primary key in order for the XML editor to be able to create the file. Please see [selecting the primary key](#) section for more information.

Step 4. Type in the value for the primary key, if the editor can not figure out a default value for the primary key (Figure 5.3C).

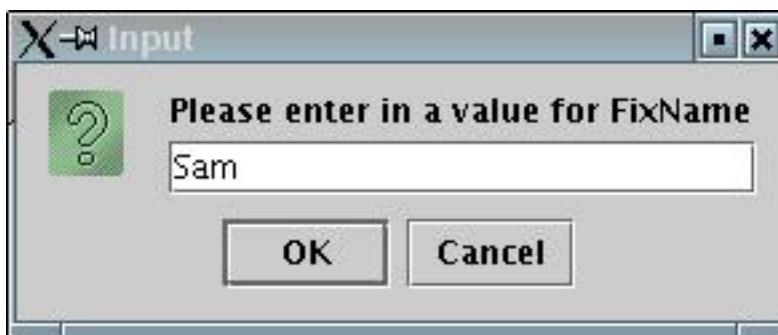


Figure 5.3C Enter value for primary key.

Step 5. Decide what children to make, if the schema contains any choices in the element being made. Please see [choice](#) section for more information.

Step 6. Decide whether or not you wish to open the XML file you just created in the XML editor. If you decide to open the new XML file you created, you will have to select the repeat element. For more information on how to select the repeat element in a document see [selecting the repeat element](#).

5.1.3 Save (Ctrl-S)

Save the XML to the current file name. If the file is not valid according to the schema specified, you will receive a warning informing you that the file is not valid.

5.1.4 Save As (Ctrl-A)

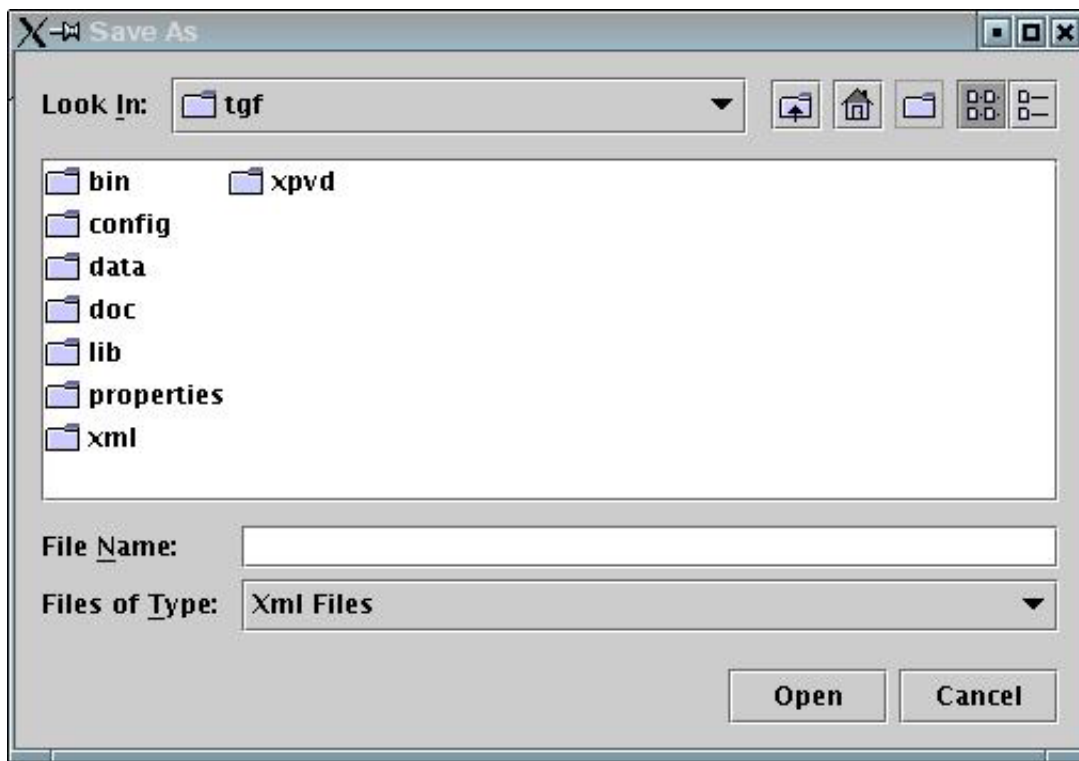


Figure 5.4 Save As Dialog

Save the XML to a selected file name. If the file is not valid according to the schema specified, you will receive a warning informing you that the file is not valid.

5.1.5 Save & Exit (Ctrl-X)

Save the XML to the current file name and close the XML Editor. If the file is not valid according to the schema specified, you will receive a warning informing you that the file is not valid.

5.1.6 Close (Alt-C)

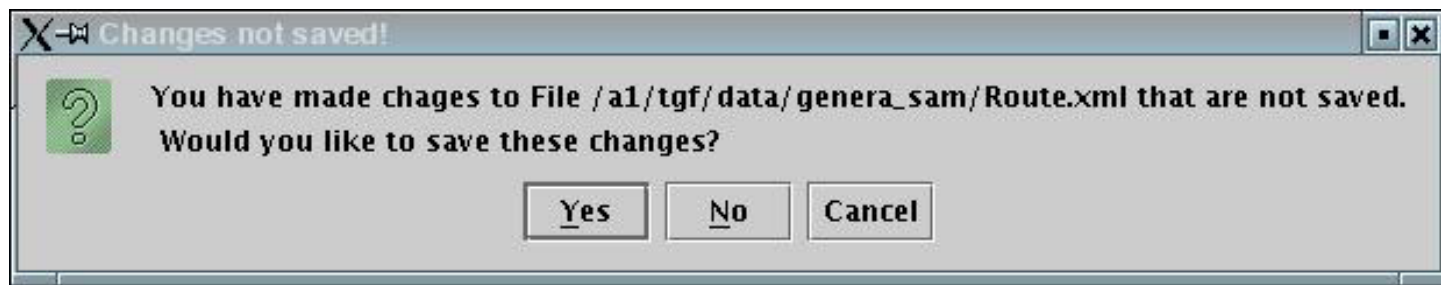


Figure 5.5 Changes not saved

Close the XML editor. Note: if changes have been made to the XML file that were not saved, you will be asked if you wish to save the changes see Figure 5.5. You can also choose not to exit the editor. If the file is not valid according to the schema file specified, you will receive a warning informing you that the file is not valid.

5.2 Edit Menu

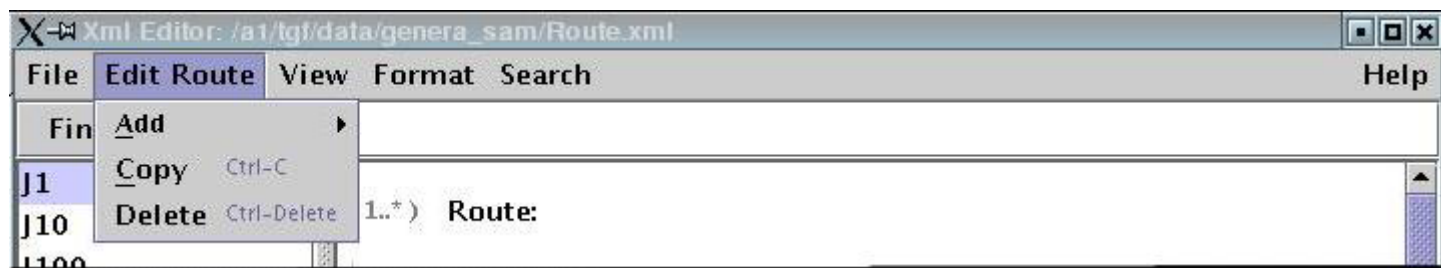


Figure 5.6 Edit Menu

5.2.1 Add Menu

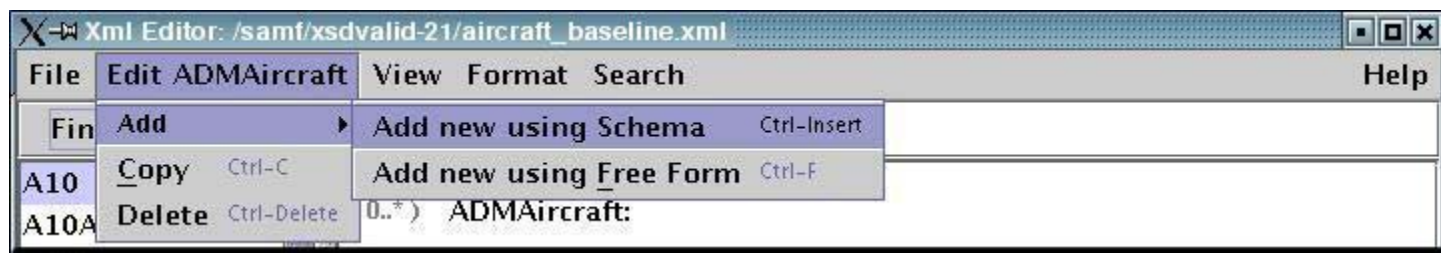


Figure 5.7 Add Menu

5.2.1.1 Add new using Schema (Ctrl-Insert)

Add a new repeat element to the XML file using the specified schema to define the new element. This option will be disabled if no schema was loaded with the XML file. The new repeat element will contain the minimum specified in the schema of each element, or one of an element if the minimum specified in the schema is zero.

5.2.1.2 Add new using Free Form (Ctrl-F)

Add a new blank repeat element to the XML file. Adds a repeat element that contains only the primary key child element. You will be asked to provide the value for the new element's primary key. **Note: using this option may cause TGF to be unable to import your XML file.**

5.2.2 Copy (Ctrl-C)

Makes a copy of the currently selected repeat element. If nothing is currently selected, then you will receive an error message. Please see the [trouble shooting/errors](#) section for details. Otherwise, you will be asked to provide a new value for the primary key. If the new primary key you entered matches a primary key already in the XML you will be asked if you want to keep the value, or try a new value.

5.2.3 Delete (Ctrl-Delete)

Deletes the currently selected repeat element. If nothing is currently selected, then you will receive an error message. Please see the [trouble shooting/errors](#) section for details.

5.3 View Menu

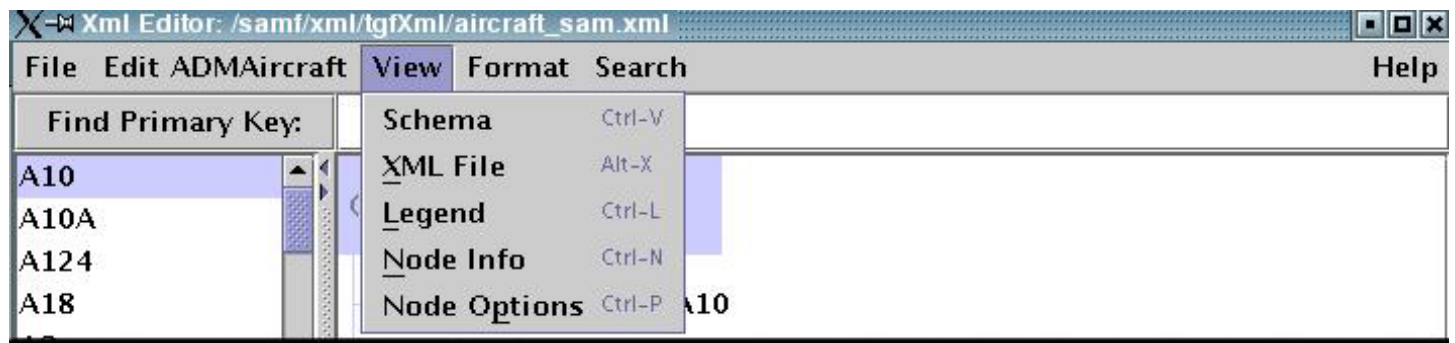


Figure 5.8 View Menu

5.3.1 Schema (Ctrl-V)

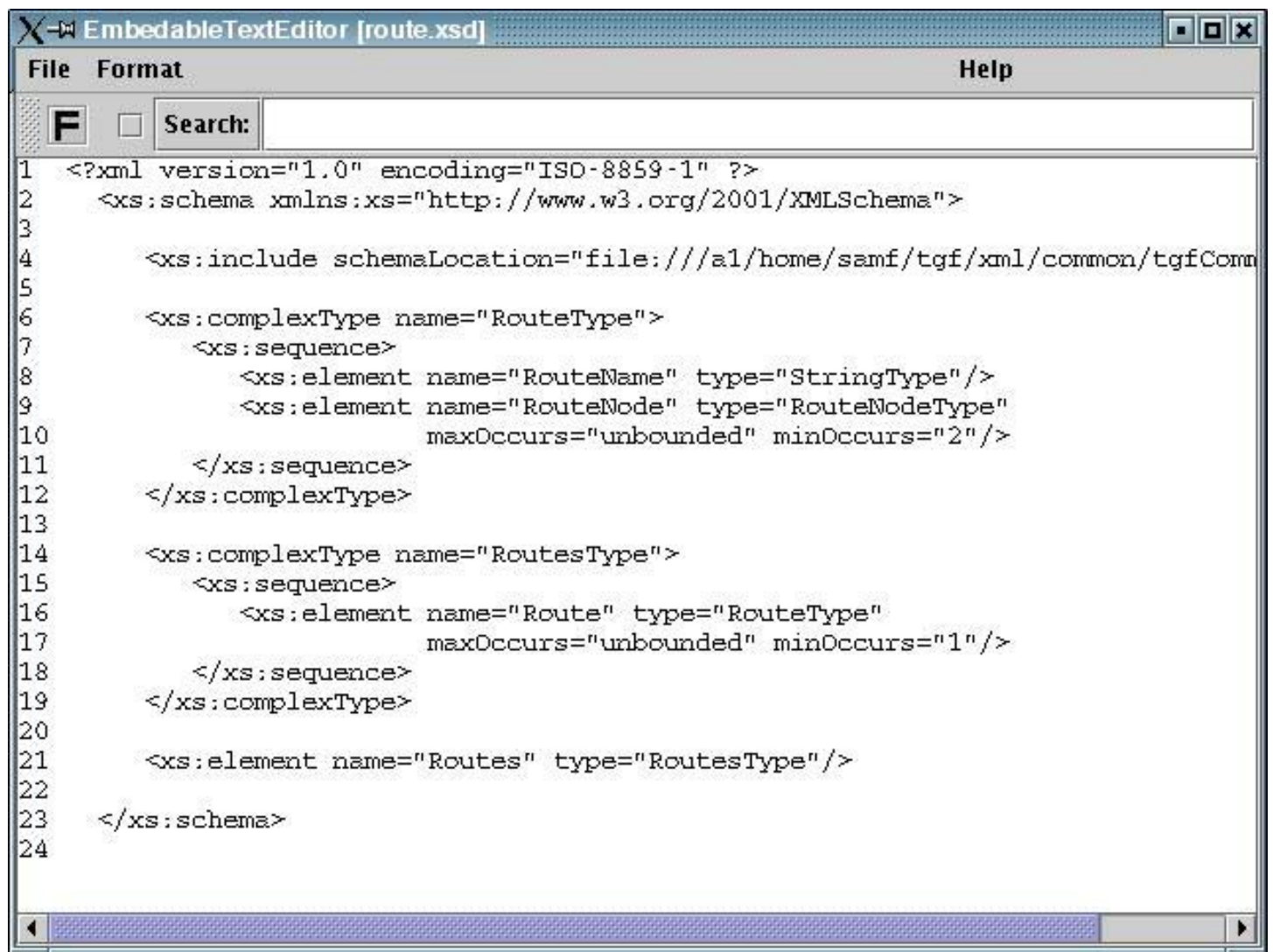


Figure 5.9 Schema File

View the schema that was specified in the XML file. This option will be disabled if there was no schema file specified in the XML file or if the editor was unable to find the schema file.

5.3.2 XML File (Alt-X)

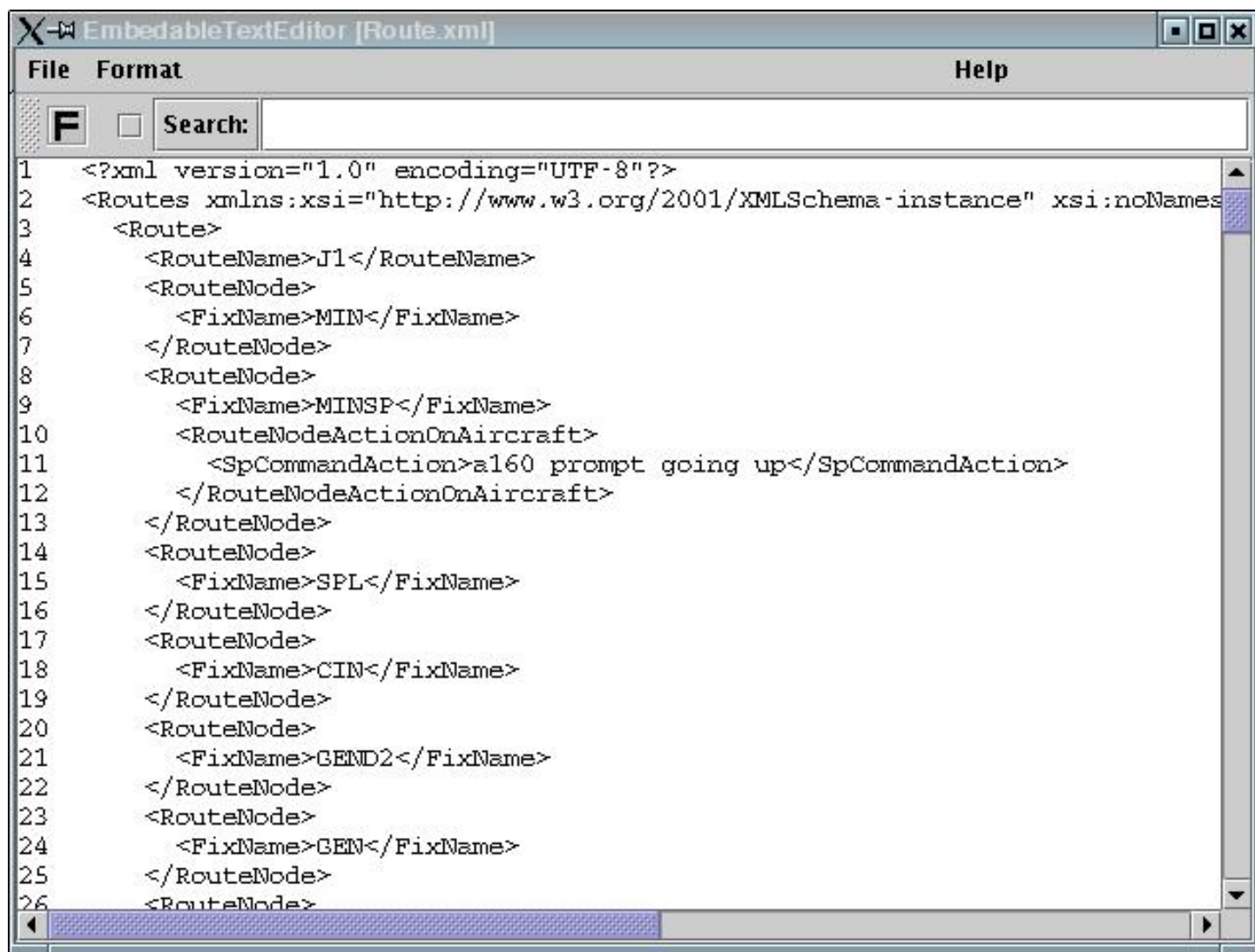
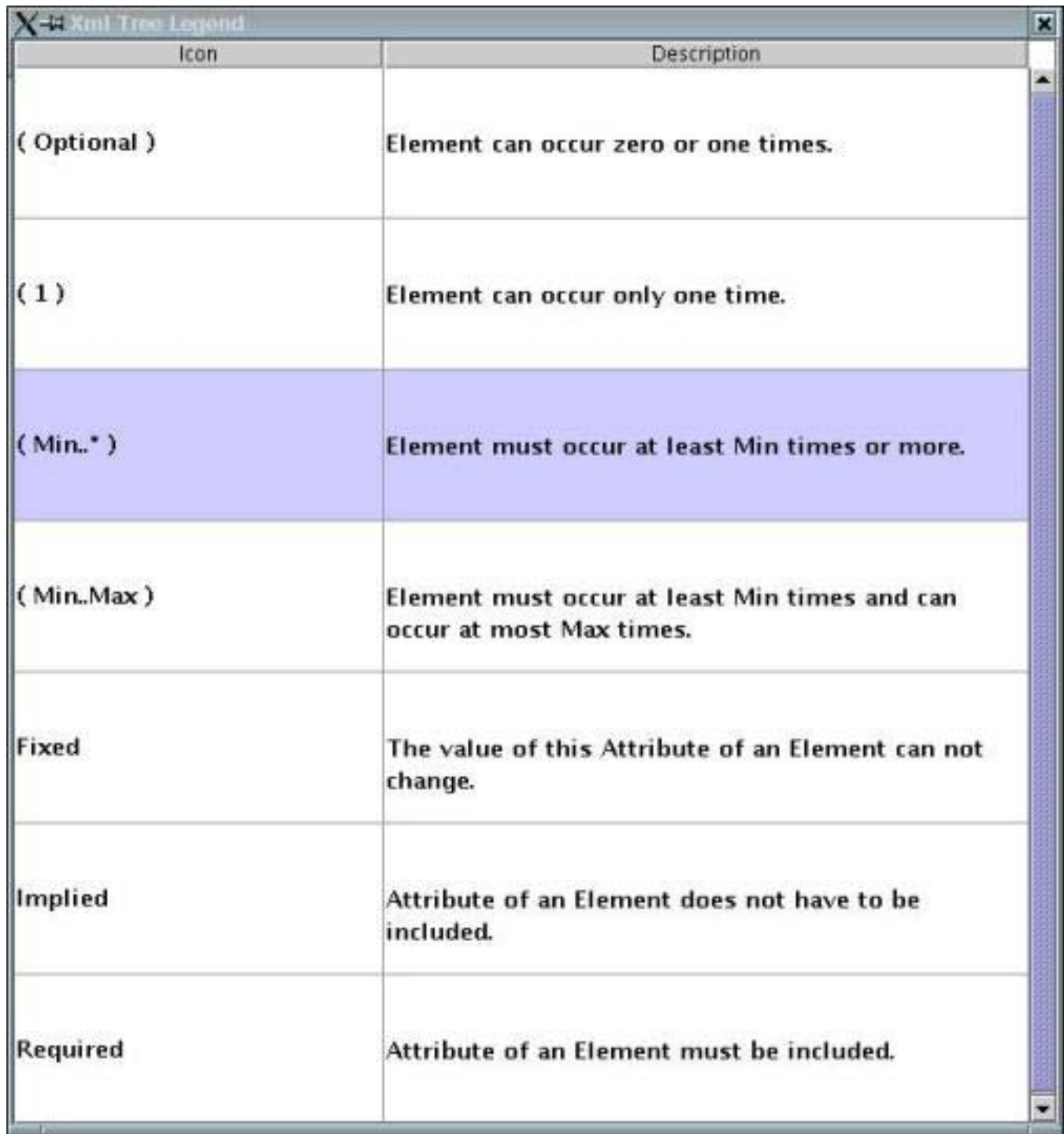


Figure 5.10 Original XML File

This option displays the most recently saved changes to the currently edited XML file.

5.3.3 Legend



Icon	Description
(Optional)	Element can occur zero or one times.
(1)	Element can occur only one time.
(Min..*)	Element must occur at least Min times or more.
(Min..Max)	Element must occur at least Min times and can occur at most Max times.
Fixed	The value of this Attribute of an Element can not change.
Implied	Attribute of an Element does not have to be included.
Required	Attribute of an Element must be included.

Figure 5.11 XML Tree Legend

The Legend explains the symbols or words that appear before the element/attribute names.

5.3.4 Node Info

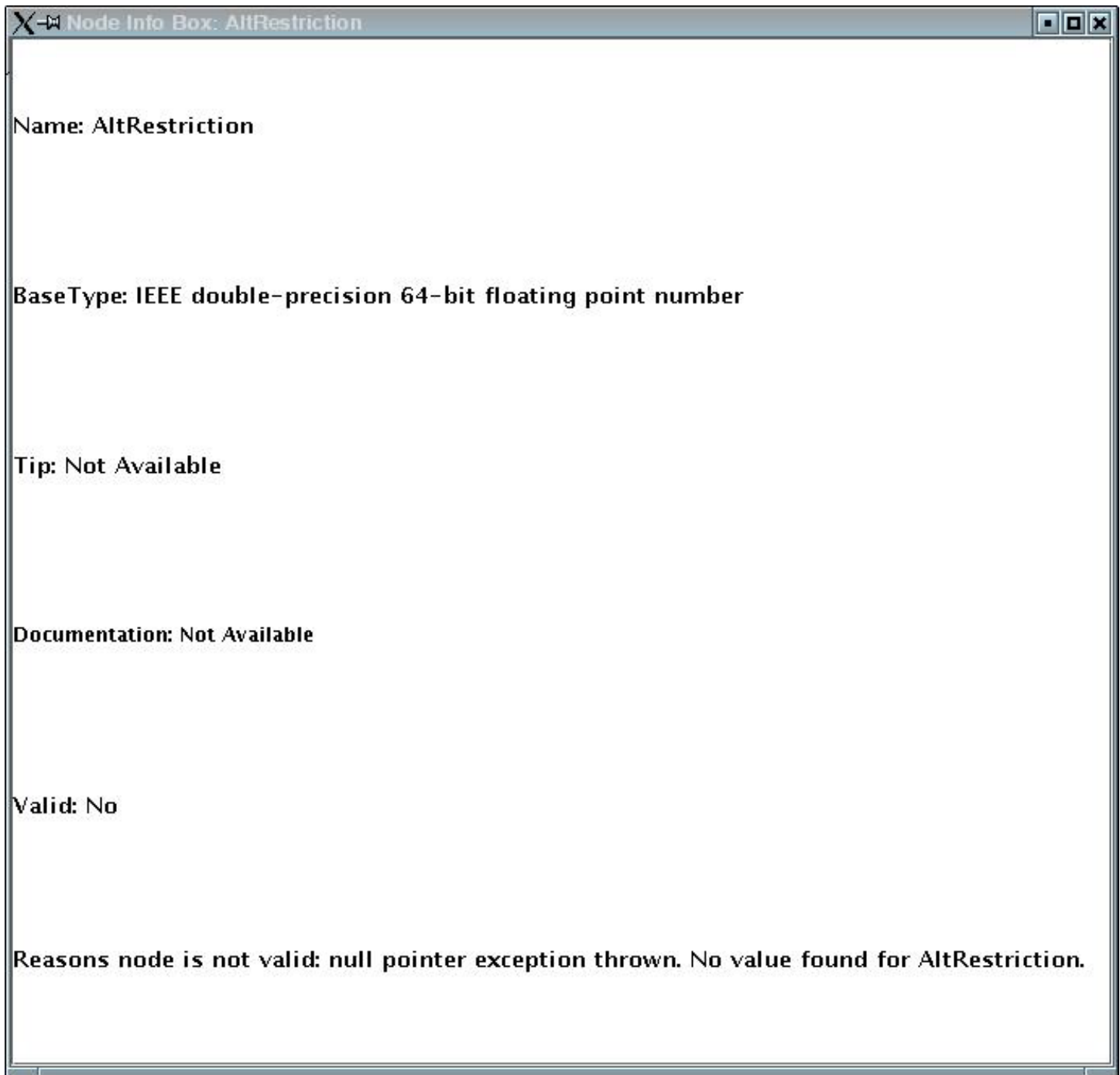


Figure 5.12 Node Info

Displays the following information about the currently selected [node](#):

1. **Name** - the name of the node
2. **BaseType** - the data type of the node. For example it could be boolean, complex, or date, etc.

3. **Tip** - any tips as to what the format of the value should be, or an explanation of the node. If this is not supplied in the schema then Not Available is displayed. See [Tool Tip Element](#) for more details.
4. **Documentation** - TGF Documentation for the element. If not supplied in the schema then Not Available is displayed. See [TgfDocumentation Element](#) for more details.
5. **Valid** - Whether or not the Node is valid.
6. **Reasons node is not valid** - The reasons a node is invalid. Otherwise, this information will not be displayed. Note: that the validation used here is not as strict as the file menu's [check validity](#). Check validity validates the XML file strictly against the schema specified in the file which means that any elements that are not defined in the schema are considered invalid. However, the validation used for the Node Info assumes that any elements not defined in the schema are valid.

5.3.5 Node Options



Figure 5.13 Node Options

If the currently selected node is an element, the editor will display a dialog similar to the one shown in Figure 5.13. This dialog contains a button that when pressed works just like you right clicked on an element, please see [element menus section](#) for more information. If there is no node currently selected or if the node currently selected is an attribute, the editor will display a blank dialog.

5.4 Format Menu



Figure 5.14 Format Menu

5.4.1 Font (Alt-F)



Figure 5.15 Font Dialog

Use this option to change the size, style, and font used to display information in the editor.

5.5 Search Menu

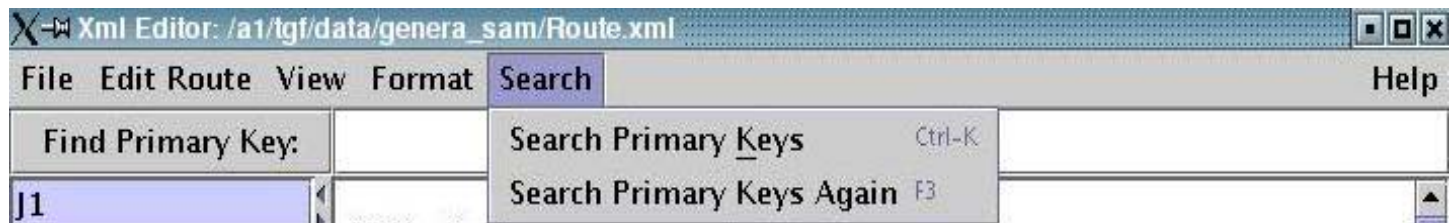


Figure 5.16 Search Menu

5.5.1 Search Primary Keys (Ctrl-K)

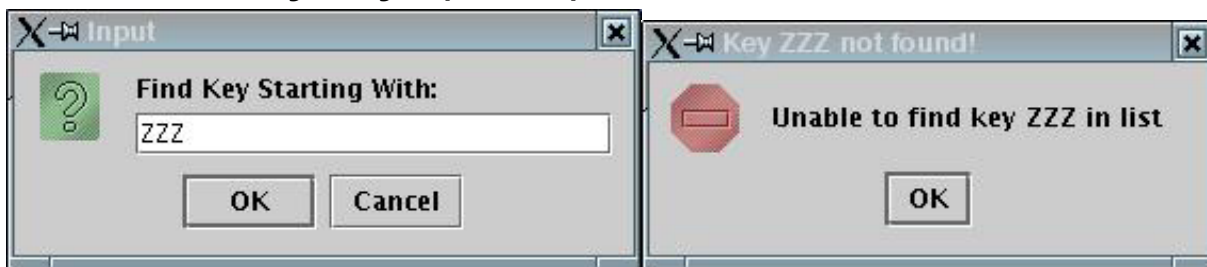


Figure 5.17A Search Primary Keys

Figure 5.17 B Text not found

Search Primary Keys works in conjunction with the [search panel](#). Pops up a dialog asking for the primary key to be searched. Searches for the first closest match in the list of primary keys for the given text. If the editor is unable to find the given text in the list of primary keys, then you should see a dialog similar to Figure 5.17B.

5.5.2 Search Primary Keys Again (F3)

Search Primary Keys Again performs the last search again. If the editor is unable to find the text in the list of primary keys, then you should see a dialog similar to Figure 5.17B.

5.6 Help Menu



Figure 5.18 Help Menu

5.6.1 Help (Ctrl-H)

This option displays this file.

6.0 Primary Key Field

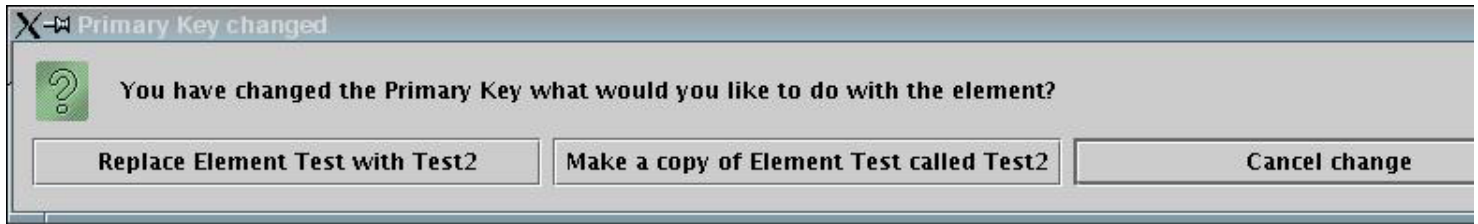


Figure 6.1 Change to primary key

Since the primary key is used to identify a repeat element in the XML file, any changes to it will have significant impact. As such, if you make a change to the value of the primary key the editor will display a dialog similar to Figure 6.1. If you choose to replace element A with element called an element B, then the editor will delete element A and create a new element B in the XML file using A's data. If you choose to cancel the changes, then the changes to the key will be undone.

7.0 Element Menus

When you right click on an element node or choose to view [node options](#) the editor will display one of two menus.

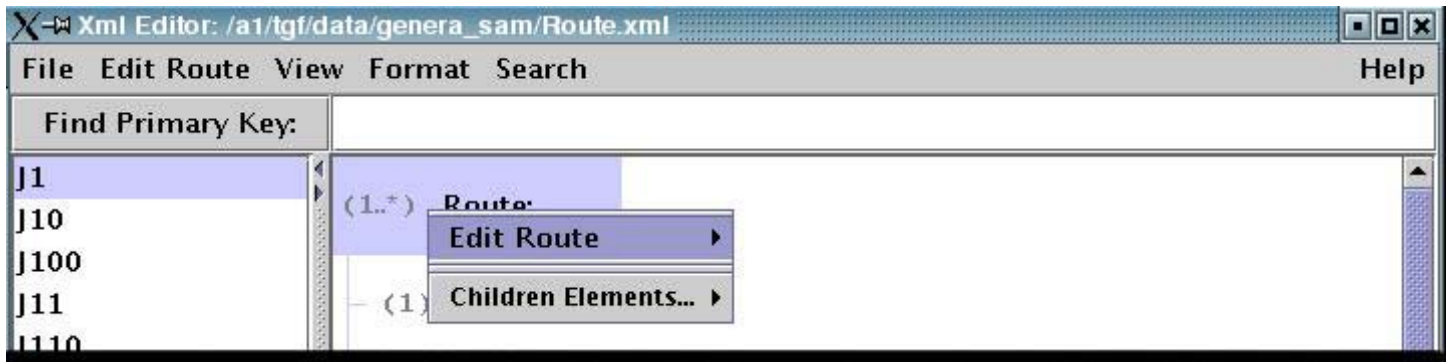


Figure 7.1 Element Menu 1

The first element menu (Figure 7.1) contains an edit menu that works just like the [edit menu](#) on the menu bar. It also contains a children elements menu which allows you to insert any new or missing schema defined children or an unknown element, if you want to insert something not defined in the schema. **Note: inserting an element not defined in the schema causes the validity check on the menu bar to fail and may cause your file not to be imported into an application.** You will be required to input the name of the element. If the element name you entered is found to be defined in the schema or if the name entered is invalid, then the XML editor will reject that name. Please see the [trouble shooting/error](#) section for details.

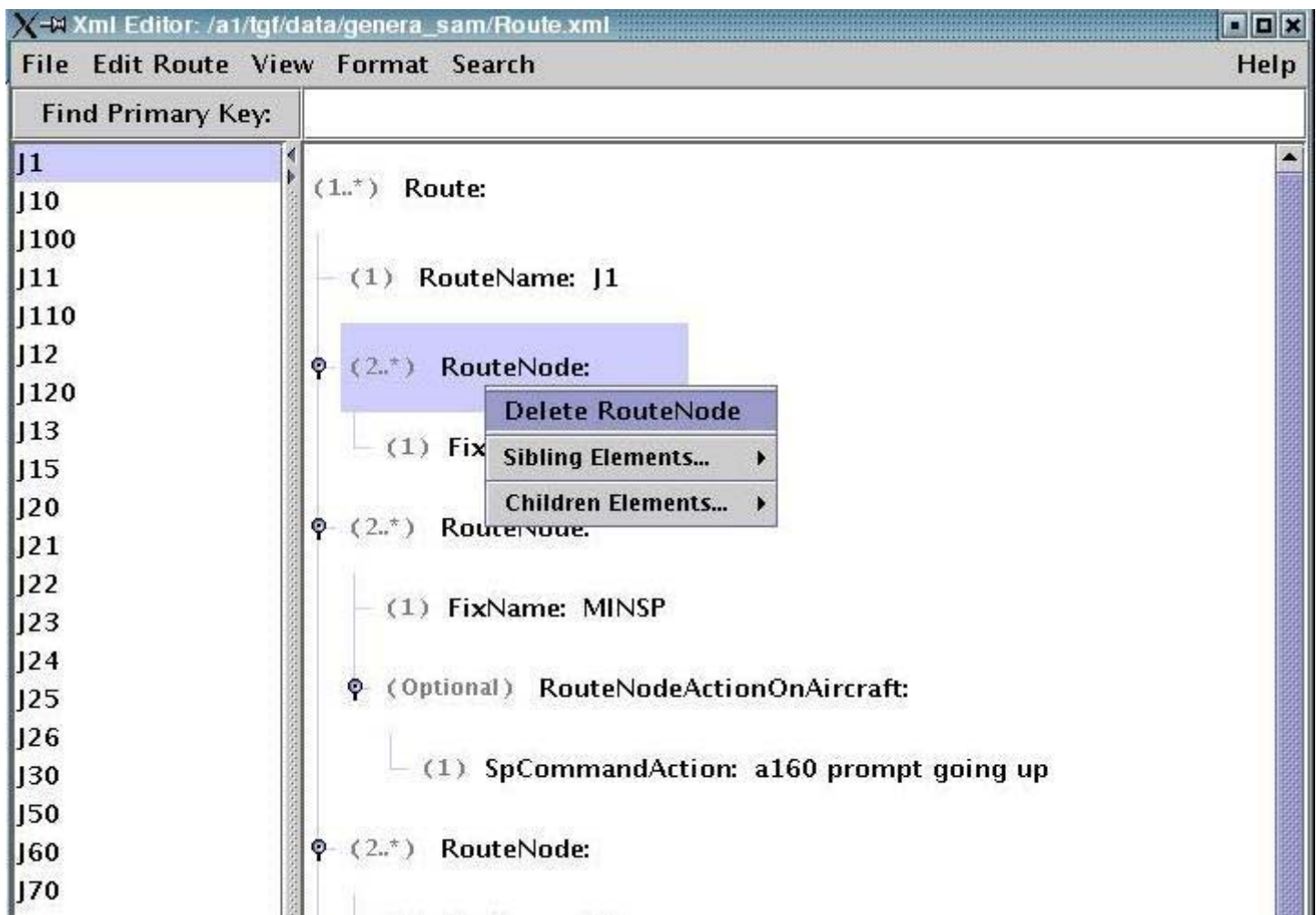


Figure 7.2 Element Menu 2

The second element menu 2 (Figure 7.2) contains a delete option that deletes the currently selected element. This option only appears if the number of elements of this type are greater than the minimum number of elements of this type specified in the schema. The sibling elements menu allows you to insert any schema defined elements that appear inside of the selected element's parent element that are missing. The sibling elements menu will be disabled if there are no elements missing from the parent. The children elements menu allows you to insert any missing schema defined children of the element or an unknown element if you want to insert something not defined in the schema. **Note: inserting an element not defined in the schema causes the validity check on the menu bar to fail and may cause your file not to be imported into an application.** You will be required to input the name of the element. If the element name you entered is found to be defined in the schema or if the name entered is invalid, then the XML editor will reject that name. Please see the [trouble shooting/error](#) section for details.

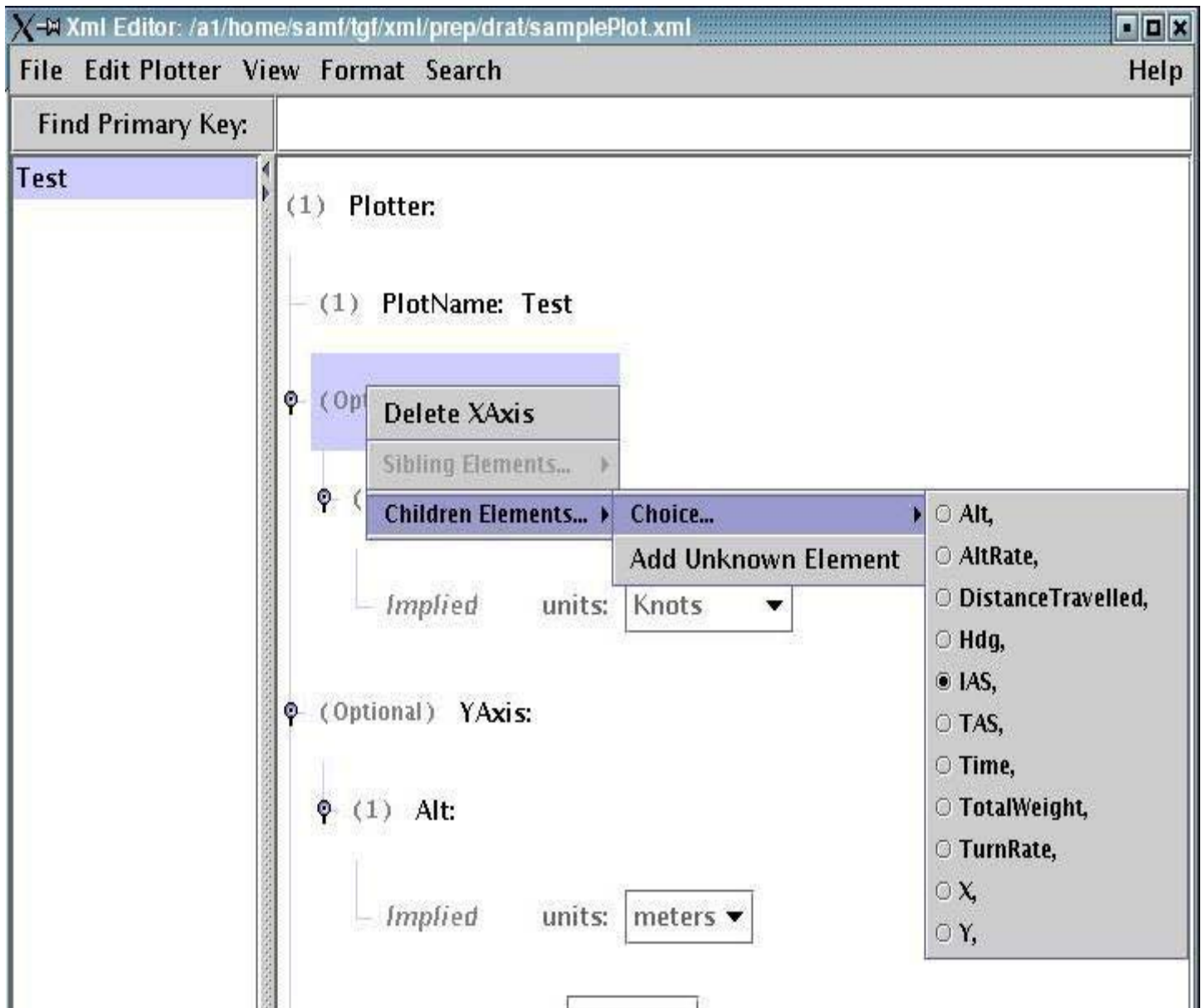


Figure 7.3 Element Menu 3

If the schema for the XML file contains a choice whose min and max equal 1, then the XML editor will make a menu similar to Figure 7.3. On this menu, the portions of the choice are listed separately with the currently existing portion of the choice selected. If you select an option in the menu you will see a dialog box appear similar to the one shown in Figure 7.4. If you decide to go through with the change, then click on Yes. If any more choices are found, then you will be asked to select what portion of those choices to make. The currently existing portion of the choice will be deleted. If you don't want to go through with the change, then click on No. For more information on choices please see the [choice](#) section.

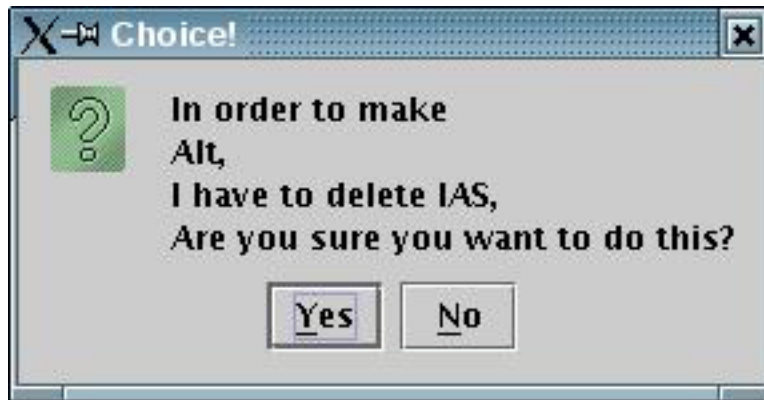


Figure 7.4 Choice dialog

8.0 Choices

```
<xs:complexType name="AxisType">
  <xs:choice>
    <xs:element name="Alt" type="DistType"/>
    <xs:element name="AltRate" type="AltRateType"/>
    <xs:element name="DistanceTravelled" type="DistType"/>
    <xs:element name="Hdg" type="HdgType"/>
    <xs:element name="IAS" type="SpeedType"/>
    <xs:element name="TAS" type="SpeedType"/>
    <xs:element name="Time" type="TimeType"/>
    <xs:element name="TotalWeight" type="TotalWeightType"/>
    <xs:element name="TurnRate" type="TurnRateType"/>
    <xs:element name="X" type="DistType"/>
    <xs:element name="Y" type="DistType"/>
  </xs:choice>
</xs:complexType>
```

Figure 8.1 Example of a <xs:choice> element

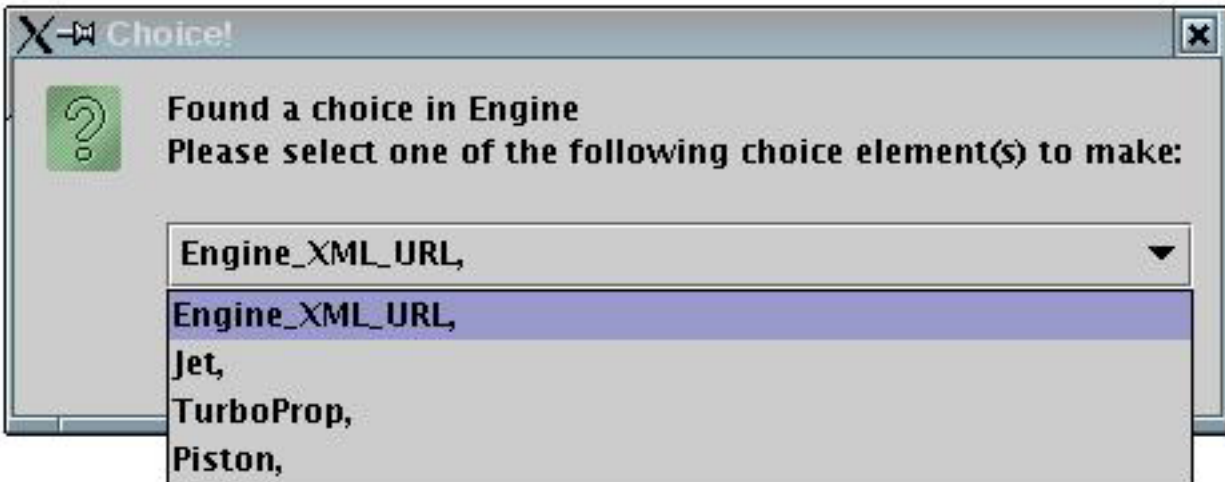


Figure 8.2 Choice dialog 2

<xs:choice> is part of the W3C standard for schemas. <xs:choice> is commonly used to specify that either the order that the elements appear in an XML file is not important, or only one of several children contained in the <xs:choice> can exist at a time. It is the latter specification with which the editor is concerned. If the XML editor detects the presence of a <xs:choice> in the schema file it will look to see if the number of occurrences of the choice are equal to 1. Note: if <xs:choice> does not state the min and max occurrences then both min and max are understood to be one. This means that only one of the possible choices can exist at a time. If you are adding an element that contains a <xs:choice> in it you will be asked by the editor to select one of the possible choices (Figure 8.2). If you decide that you want to exchange the currently existing child for another child in the choice then follow the directions provided in the [element menu](#) section.

9.0 Schema values defined by TGF

The following section talks about schema values, such as tool tip, TGF documentation, and multi-line string. These values are defined by TGF for use by the XML editor and are **NOT** part of the schema definition as defined by the W3C organization. For more information of the W3C standard schema definition please go to <http://www.w3.org/XML/Schema>.

9.1 ToolTip Element

```
<xs:simpleType name="LatitudeType">
  <xs:annotation id="Latitude.annotation">
    <xs:appinfo xml:lang="en">
      <ToolTip>
        Example of a Latitude 34-45-23.005N or 35-02-12.04S
      </ToolTip>
    </xs:appinfo>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:pattern value="\d{2}-\d{2}-\d{2}(\.\d\d?\d?)?(S|N)?" />
  </xs:restriction>
</xs:simpleType>
```

Figure 9.1 ToolTip Element

ToolTip is an element inside of the schema file defined inside of the W3C standard appinfo element. The ToolTip is used by TGF to create tips for the user as to the format of an element. An example of a ToolTip Element is shown in Figure 9.1. The element should contain information that will help the user fill in the containing node.

9.2 TgfDocumentation Element

The TgfDocumentation element is an element inside of the schema file defined inside of the W3C standard appinfo element used by TGF for documentation purposes. This element should contain information as to what the containing node's purpose/use of is in TGF.

9.3 MultiLine String Type

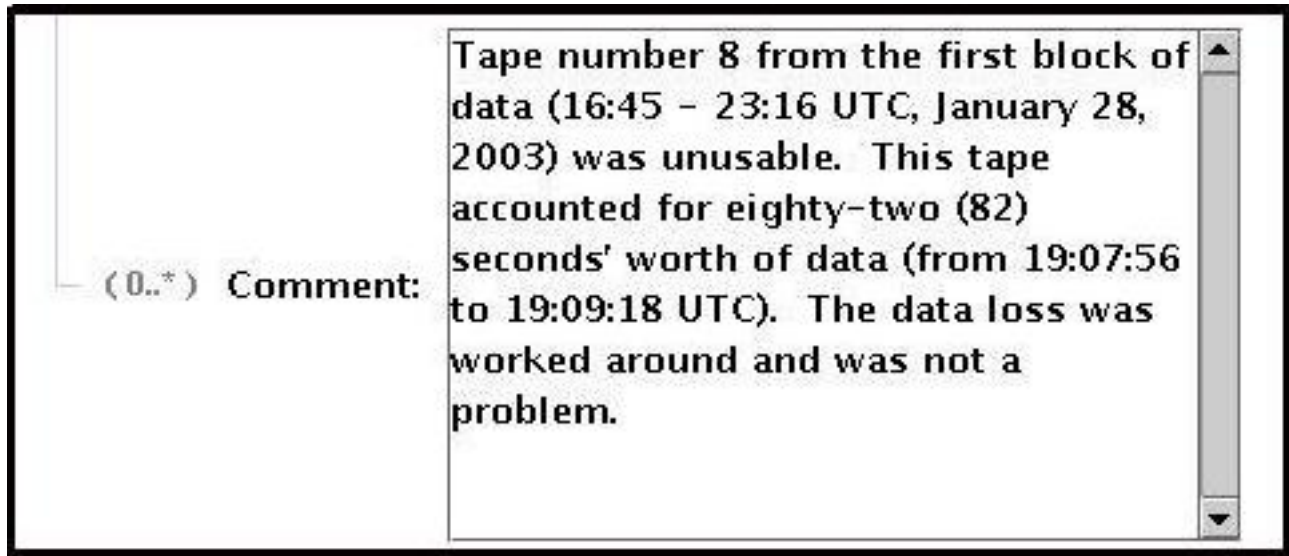


Figure 9.2 MultiLine String Type Display

MultiLineStringType is a node type defined in [tgfCommon.xsd](#) used to mark strings that can be more than one line. This type is used by the XML editor to create a special display, shown in Figure 9.2, for nodes marked as this type.

10.0 Invalid Node vs. Valid Node

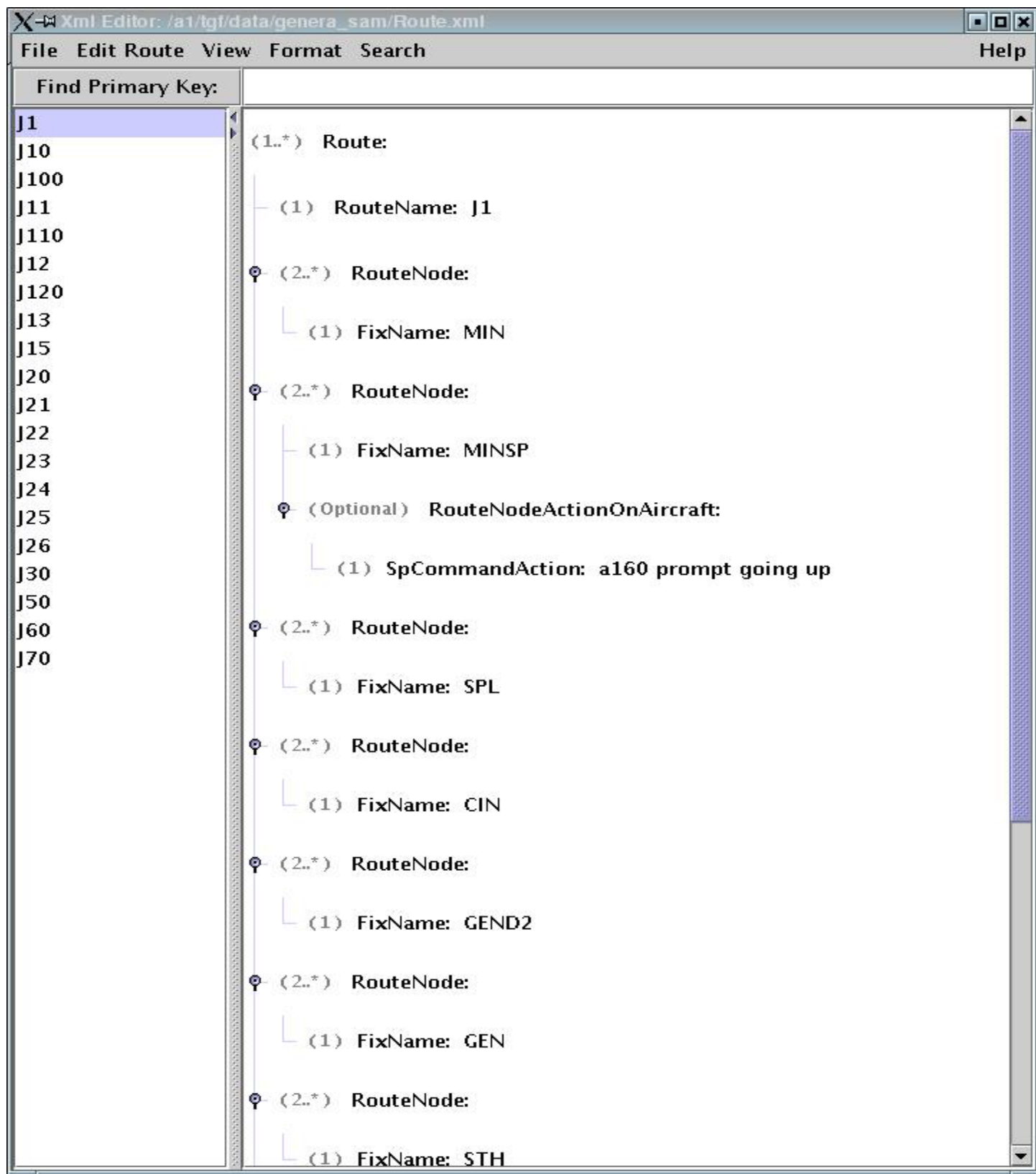


Figure 10.1 Valid Node

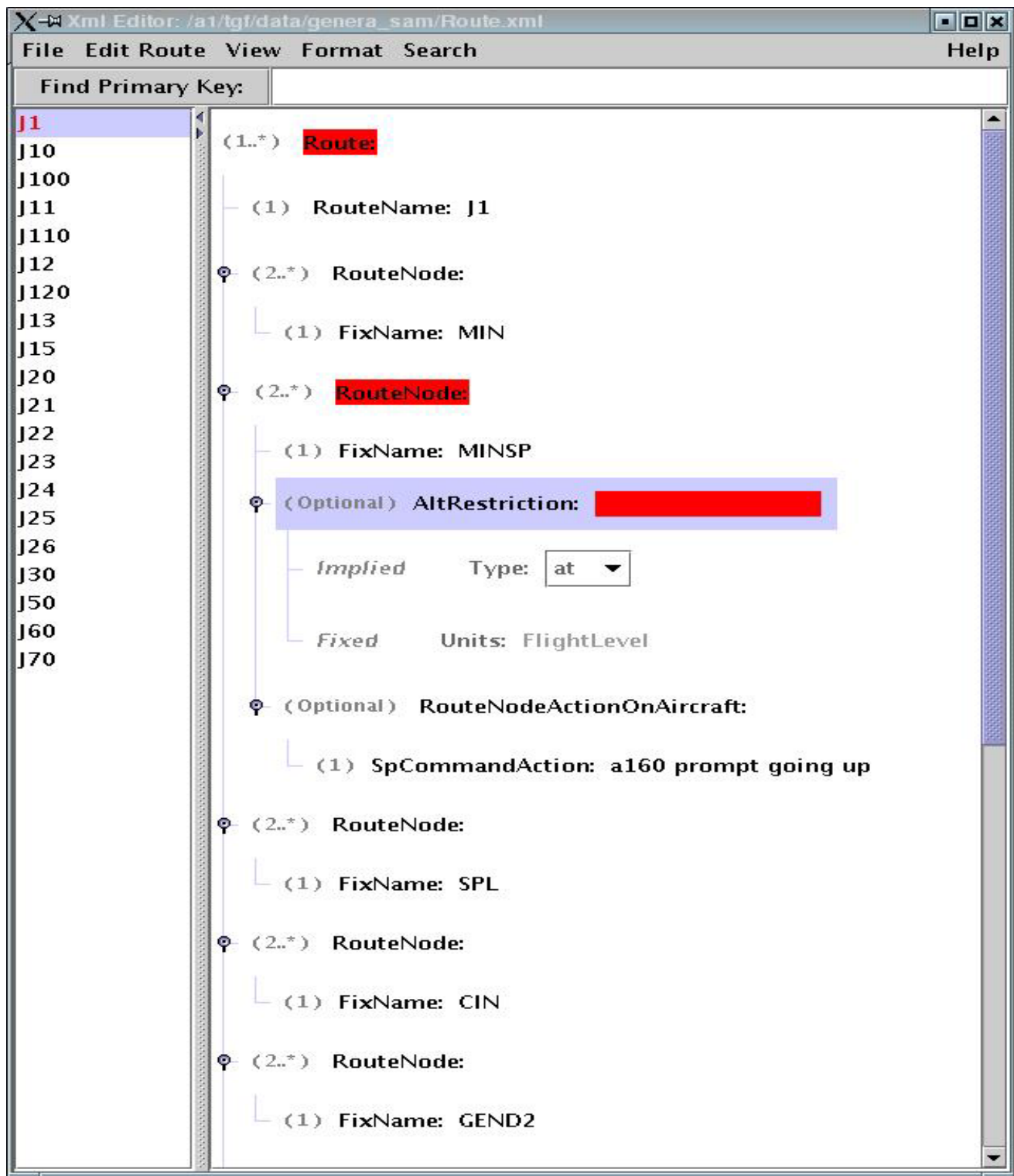


Figure 10.2 Invalid Node

If a repeat element contains an invalid node, then that repeat element will appear in red in the list of primary keys. The ancestors of the invalid node will appear in red as well as all the way up to the top of the tree in the XML editor. To make the node valid, try viewing the [node info](#) to see the error. Once the problem is fixed, the node should change back to the normal viewing color.

11.0 Trouble Shooting/Errors

Below is a table of the errors that can occur when using the XML editor.

Error Message Guide:

<u>Error</u>	<u>Explanation</u>	<u>When it Appears</u>	<u>How to Correct</u>
<u>File is not valid.</u>	Something in the XML file does not match what was described in the schema specified in the file. The error lists one reason why the file is invalid.	Appears when the validity of the XML file is checked using the file menu's <u>check validity</u> .	To ensure that a file is valid, try to fill in all known values and delete any unnecessary elements and check the validity of the file again.
<u>No selected element to copy.</u>	No repeat element is currently selected.	Appears when an attempt to copy a repeat element was made using the edit menu's <u>copy</u> and there is no repeat element selected.	Simply select an element to copy and perform the copy again.
<u>No selected element to delete.</u>	No repeat element is currently selected.	Appears when an attempt to delete a repeat element was made using the edit menu's <u>delete</u> and there is no repeat element selected.	Simply select an element to delete and perform the delete again.
<u>Can not have blank key!</u>	Primary key field has no value in it.	Appears when the primary key field is blanked out.	Once you press okay the editor will reset the primary key back to its old value.
<u>UNABLE TO VALIDATE FILE!</u>	The XML editor was unable to validate the file against the schema (if any) specified in the file.	Appears when you open the XML file.	Check the XML file to see if there is a schema specified. If there is check to see if the schema specified in the XML exists. If the file exists then check the read permissions of the file.

Error Message Guide (continued):

<u>Error</u>	<u>Explanation</u>	<u>When it Appears</u>	<u>How to Correct</u>
Unable to find Schema for <name and path of xml file>. Unable to validate document.	The XML editor was either unable to find a schema specified in the file or was unable to locate the specified schema.	Appears when you open the XML file.	Check the XML file to see if there is a schema specified. If there is, check to see if the schema specified in the XML exists. If the file exists, check the read permissions of the file.
Problem with the provided file. Please verify its schema and primary key.	The XML editor was unable to open the XML file for some reason.	Appears when you attempt to open the XML file.	Check the format of the XML. Make sure that the primary key values are filled in.
Unable to save <name and path of xml file> due to <error>.	The XML editor was unable to save the file for some reason.	Appears when you attempt to save the XML file.	Check to see if you have permission to write to the file. If you are able to change the permission of the file so that you can write to it and try saving again.
Unable to find key <text> in list.	Key that was entered in either the search panel or the search menu was not found in the list of primary keys.	Appears when you perform a search.	Try looking for a shorter version of the key you are looking for.
Unable to import schema <full path and name of schema file>.	The Schema used to create a new XML file was not found.	Appears when you attempt to create a new XML file using the file menu's create a new XML file.	Check to see if the schema specified in the XML exists. If the file exists, check the read permissions of the file, and that the format of the schema is valid.
Unable to create <element name> element due to <error>.	You attempted to create an non-schema defined element and/or typed in an invalid name.	Appears when you attempt to add a non-schema defined element.	Try adding unknown element with a different name.
Problem opening file <full path and name of XML file>.	The Editor was unable to open the given XML file.	Appears when you attempt to open the file.	Check to see if the file specified exists, that you have permission to read it, and that it is not empty.
NoClassDefFoundError	The Java virtual environment was unable to locate a class used by the XML editor.	Appears when you try to bring up the XML editor using the command line.	Check to see that you have the following jars and that they are in your Java class path: xercesImpl.jar, xalan.jar, jdom.jar, and xmlParserAPIs.jar.

12.0 Miscellaneous

For more information about W3C please see <http://www.w3.org/>.

For more information about XML please see <http://www.w3.org/XML/> .

For more information on XML schema definition please see <http://www.w3.org/XML/Schema>.

For more information on TGF please see <http://www.tgf.tc.faa.gov>.

Submit bugs, comments, or other to TGF Bug Report at <http://www.tgf.tc.faa.gov/bugrat/report/> .

Appendix

In order to facilitate the understanding of the symbols/text used in the XML editor, the following tables have been provided for your reference:

A [Legend](#)

B [Errors](#)

Glossary

Ancestors - The parent, grandparent, great grandparent, and so on of a node.

Child - A node that is contained inside of another node in the XML.

ECO GUI - Target Generation Facility's Exercise Control Operator Graphic User Interface.

Node - an element or an attribute in the XML file.

Primary Key - An element inside of the repeat element that makes that repeat element unique from all other repeat elements.

Repeat Element - An element inside of the root element that occurs one or more times.

Root Element - Located at the top of the XML file, it is the element that contains all the other elements inside the document. Usually, it also contains the location and name of the schema file to be used to validate the XML file.

Schema 1. An XML document that uses the W3C standard to define the layout of an other XML file and the types of data that the element(s) and attribute(s) inside of the XML file can hold.

2. An XML document that defines, describes, and catalogues XML vocabularies for classes of XML documents. Constraints expressed in a schema are obeyed in the XML document.

TGF - Target Generation Facility

W3C - World Wide Web Consortium

XML - Extensible Markup Language